Stockholm University
Department of Materials and Environmental Chemistry

Advanced transmission electron microscopy
Sept 28 – Oct 28, 2016

KZ8010   7.5hp   http://sisu.it.secure.su.se/search/info/KZ8010/en

The course will start on September 28 (Wednesday) at 9:15 in room C516 (5Ö), Arrhenius Laboratory, Stockholm University.
Lectures, problem solutions and practical training sessions are conducted at 9:15-12:00 and 13:00-16:00 according to the detailed schedule below.
Demonstrations, problem solutions, practical training sessions and group project are the _compulsory parts_ in the course.

Teachers:
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Literature:
WC: _Transmission Electron Microscopy: A Textbook for Materials Science_, D.B.Williams and C.B.Carter, Springer
ZHO: _Electron Crystallography - Electron microscopy and electron diffraction_, X. Zou, S. Hovmöller and P. Oleynikov, Oxford University Press
* Additional materials may be given in the lectures and practical sessions.
# The actual date of lab and exercise depends on the number of participants and will be finalized at the beginning of the course.

Week	Date		Teacher	Lecture (9:15 – 12:00)	Literature	Lab (13:00-16:00) #
39	28/9 (Wed)		WW	General introduction		
		L1	WW	Basics of electron crystallography	ZHO 1-3	Group project – sample preparation
	30/9 (Fri)	L2	WW	New electron diffraction techniques and quantification of electron diffraction	ZHO 5	Computer lab: Quantification of ED patterns, indexing
40	4/10 (Tue)	L3	WW	Bloch wave, Dispersion surface	WC14-15	Group project – ED data collection
	5/10 (Wed)	L4	WW	Kikuchi Pattern, CBED	WC19-21	Group project – ED data collection
	7/10 (Fri)	L5	WW	Thickness and Bend contours	WC23	Group project – ED data analysis
41	11/10 (Tue)	L6	CWT	Defects (stacking fault, dislocation)	WC24-25	
	12/10 (Wed)	L7	WW	Quantification and processing of HRTEM images	ZHO 6-7	Computer lab: Structure determination from HRTEM
	14/10 (Fri)	L8	WW	Structure determination and refinement from SAED, Simulation software demonstration	ZHO 8-9	Group project – HRTEM data collection
42	18/10 (Tue)	L9	WW	3D reconstruction by electron tomography and electron crystallography	ZHO 11 *	Group project – HRTEM data analysis
	19/10 (Wed)	L10	CWT	STEM (BF, ADF & HAADF)	WC31 *	Demonstration STEM
	21/10 (Fri)	L11	SC	Electron energy loss spectroscopy (EELS)	WC37-40 *	Demonstration EELS
43	25/10 (Tue)	L12	SC	Electron energy loss spectroscopy (EELS)	WC37-40 *	
	26/10 (Wed)		**Project Presentation (9:15-12:00)**			
	28/10 (Fri)		**Examination (9:15-14:00)**			